UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,219	03/10/2004	Zuei-Tien Chao	250122-1400	4109

24504 7590 04/27/2007

THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
100 GALLERIA PARKWAY, NW
STE 1750
ATLANTA, GA 30339-5948

EXAMINER	
DHARIA, PRABODH M	
ART UNIT	PAPER NUMBER
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/797,219	CHAO ET AL.	
	Examiner	Art Unit	
	Prabodh M. Dharia	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-11,14-19 and 22-24* is/are rejected.

7)☒ Claim(s) *4,5,12,13,20 and 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. **Status:** Please all the replies and correspondence should be addressed to examiner's new art unit 2629. Receipt is acknowledged of papers submitted on 03-29-2007 under amendments and request for reconsideration, which have been placed of record in the file. Claims 1-24 are pending in this action.

Response to Amendment

2. The amendment filed 03-29-2007does not introduce any new matter into the disclosure. . The added material is supported by the original disclosure. Drawing is amended per objection. Therefore objection is withdrawn. Claim 8 has been amended to depend from claim 6, and claim 16 has been amended to depend from claim 14.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe et al. (US 2003/0169247 A1) in view of Yamada, Atsushi (US 2003/0169226).

Regarding Claim 1, Kawabe et al. teaches a driving circuit for outputting a video signal (page 2, paragraph 10, Lines 1-7) to control a liquid crystal display panel (page 1, paragraph 1,

Lines 1,2) according to an image control signal provided by a host (page 3, paragraph 24, Lines 1-3, video signal is received from outside - a host), the liquid crystal display panel including a plurality of light emitting elements (page 1, paragraph 1, Lines 4,5) and display cells (page 11, paragraph 116, Line 4), the display cells respectively connecting to a plurality of data electrodes (page 11,12, paragraph 116,) and gate electrodes, the driving circuit comprising: a gate driver outputting scan signals to the gate electrodes; a data driver outputting the video signals to the data electrodes (page 7, paragraphs 88-90) according to the image control signal (page 3, paragraph 24, Lines 1-3).

However, Kawabe et al. fails to disclose a voltage controlling signal corresponding to a brightness adjustment signal; a driving voltage generator outputting a driving voltage according to the voltage controlling signal; coupled to the driving voltage generator generating brightness corresponding to the driving voltage output by the driving voltage generator.

However, Yamada, Atsushi discloses a voltage controlling signal corresponding to a brightness adjustment signal (page 2, paragraph 25 Lines 1-8); a driving voltage generator outputting a driving voltage according to the voltage controlling signal (page 2, paragraph 25, Lines 8-10); coupled to the driving voltage generator generating brightness corresponding to the driving voltage output by the driving voltage generator (page 2, paragraphs 25-27).

The reason to combine by controlling voltage supplied to backlight circuitry consisting of LEDs not only brightness is uniform and display quality is improved but also current converted form generated voltage is also controlled and power energy for LEDs used efficiently.

Thus it would have been obvious to one in the ordinary skill in the art at the time of invention was made to incorporate the teaching of Yamada, Atsushi in the teaching of Kawabe et

al. to be able to have LCD, with reduced change in luminance; prevented screen blinking; minimized flickering and achieves better resolution display by controlling voltages generated for LEDs as per brightness requirement of the LCD (page 2, paragraph 19).

Regarding Claim 9, Kawabe et al. teaches a driving circuit for outputting a video signal (page 2, paragraph 10, Lines 1-7) to control a liquid crystal display panel (page 1, paragraph 1, Lines 1,2) according to an image control signal provided by a host (page 3, paragraph 24, Lines 1-3, video signal is received from outside - a host), the liquid crystal display panel including a plurality of light emitting elements (page 1, paragraph 1, Lines 4,5) and display cells (page 11, paragraph 116, Line 4), the display cells respectively connecting to a plurality of data electrodes (page 11,12, paragraph 116,) and gate electrodes, the driving circuit comprising: a gate driver outputting scan signals to the gate electrodes; a data driver outputting the video signals to the data electrodes (page 7, paragraphs 88-90) according to the image control signal (page 3, paragraph 24, Lines 1-3).

However, Kawabe et al. fails to disclose a voltage controlling signal corresponding to a brightness adjustment signal; a driving voltage generator outputting a driving voltage according to the voltage controlling signal; coupled to the driving voltage generator generating brightness corresponding to the driving voltage output by the driving voltage generator.

However, Yamada, Atsushi discloses a voltage controlling signal corresponding to a brightness adjustment signal (page 2, paragraph 25 Lines 1-8); a driving voltage generator outputting a driving voltage according to the voltage controlling signal (page 2, paragraph 25,

Lines 8-10); coupled to the driving voltage generator generating brightness corresponding to the driving voltage output by the driving voltage generator (page 2, paragraphs 25-27).

The reason to combine by controlling voltage supplied to backlight circuitry consisting of LEDs not only brightness is uniform and display quality is improved but also current converted form generated voltage is also controlled and power energy for LEDs used efficiently.

Thus it would have been obvious to one in the ordinary skill in the art at the time of invention was made to incorporate the teaching of Yamada, Atsushi in the teaching of Kawabe et al. to be able to have LCD, with reduced change in luminance; prevented screen blinking; minimized flickering and achieves better resolution display by controlling voltages generated for LEDs as per brightness requirement of the LCD (page 2, paragraph 19).

5. Claims 6,8,14,16,17 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe et al. (US 2003/0169247 A1) in view of Yamada, Atsushi (US 2003/0169226) as applied to claims 1,9 above, and further in view of Tamaoki, Satoshi et al. (US 2005/0168987 A1).

Regarding Clam 17, Kawabe et al. teaches a driving circuit for outputting a video signal (page 2, paragraph 10, Lines 1-7) to control a liquid crystal display panel (page 1, paragraph 1, Lines 1,2) according to an image control signal provided by a host (page 3, paragraph 24, Lines 1-3, video signal is received from outside - a host), the liquid crystal display panel including a plurality of light emitting elements (page 1, paragraph 1, Lines 4,5) and display cells (page 11, paragraph 116, Line 4), the display cells respectively connecting to a plurality of data electrodes

(page 11,12, paragraph 116,) and gate electrodes, the driving circuit comprising: a gate driver outputting scan signals to the gate electrodes; a data driver outputting the video signals to the data electrodes (page 7, paragraphs 88-90) according to the image control signal (page 3, paragraph 24, Lines 1-3).

However, Kawabe et al. fails to disclose a voltage controlling signal corresponding to a brightness adjustment signal; a driving voltage generator outputting a driving voltage according to the voltage controlling signal; coupled to the driving voltage generator generating brightness corresponding to the driving voltage output by the driving voltage generator.

However, Yamada, Atsushi discloses a voltage controlling signal corresponding to a brightness adjustment signal (page 2, paragraph 25 Lines 1-8); a driving voltage generator outputting a driving voltage according to the voltage controlling signal (page 2, paragraph 25, Lines 8-10); coupled to the driving voltage generator generating brightness corresponding to the driving voltage output by the driving voltage generator (page 2, paragraphs 25-27).

The reason to combine by controlling voltage supplied to backlight circuitry consisting of LEDs not only brightness is uniform and display quality is improved but also current converted form generated voltage is also controlled and power energy for LEDs used efficiently.

Thus it would have been obvious to one in the ordinary skill in the art at the time of invention was made to incorporate the teaching of Yamada, Atsushi in the teaching of Kawabe et al. to be able to have LCD, with reduced change in luminance; prevented screen blinking; minimized flickering and achieves better resolution display by controlling voltages generated for LEDs as per brightness requirement of the LCD (page 2, paragraph 19).

Kawabe et al. fails to disclose a plurality of light emitting elements connected in serially.

However, Tamaoki, Satoshi et al. discloses a plurality of light emitting elements connected in serially are used as backlighting for LCD (page 13, paragraph 148, page 36, paragraph 300).

The reason to combine Tamaoki, Satoshi et al. discloses semi-conductor LEDs for backlighting LCD display can be serially or parallel connected and illumination intensity is achieved.

Thus it would have been obvious to one in the ordinary skill in the art at the time of invention was made to incorporate the teaching of Tamaoki, Satoshi et al. in the teaching of Kawabe et al. to be able to have LCD, with LEDs as backlighting achieving illumination intensity needed and serially connected LEDs emit light simultaneously to achieve desired brightness (page 4, paragraph 33, page 16, paragraph 160).

Further Regarding Claims 6,14 and 22, Tamaoki, Satoshi et al. teaches the light emitting elements comprise a plurality of LEDs connected in serial, parallel, or a combination of both, and a first terminal coupled to the driving voltage generator and a second terminal coupled to the data driver (page 13, paragraph 148, page 16, paragraph 160, page 36, paragraph 300).

Further Regarding Claims 8,16, and 24, Yamada, Atsushi discloses a load coupled between the second terminal and ground (please see figures 3,7,10, pages 2,3, paragraphs 25-28, page 3, paragraphs 45-50).

6. Claims 2,3,7,10,11,15,18,19 and 23, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawabe et al. (US 2003/0169247 A1) in view of Yamada, Atsushi (US

2003/0169226) as applied to claims 1,6,8,9, 14,16,17,22,and 24 above, and further in view of Sono (US 2003/0117361 A1).

Regarding Claims 2,3,7,10,11,15,18,19 and 23, Kawabe et al. fails to recite or disclose the voltage controlling signal comprises a plurality of square waves having periods of high voltage level and low voltage level; the data driver adjusts the ratio between the periods of the high voltage level and the low voltage level according to the brightness adjustment signal; and the data driver adjusts the ratio between the periods of the high voltage level and the low voltage level of the voltage controlling signal according to the voltage level of the second terminal.

Regarding Claim 2,10,18, Sono teaches the voltage controlling signal comprises a plurality of square waves having periods of high voltage level and low voltage level (pages 1,2, paragraphs 12,13).

The reason to combine Sono teaches specifically square wave variable amplitude and variable frequencies per brightness requirement of the LCD, which helps reducing change in luminance; reducing screen blinking; minimizes flickering and achieves better resolution display (see abstract and page 2, paragraph 14, page 1, paragraph 11, page 4, paragraph 44).

Thus it would have been obvious to one in the ordinary skill in the art at the time of invention was made to incorporate the teaching of Sono in the teaching of Kawabe et al. modified by Yamada, Atsushi to be able to have LCD, with reduced change in luminance; prevented screen blinking; minimized flickering and achieves better resolution display by driving a LCD display with square wave consisting of variable amplitude and variable frequencies per

brightness requirement of the LCD (see abstract and page 2, paragraph 14, page 1, paragraph 11, page 4, paragraph 44).

Further Regarding Claims 3,11 and 19 Sono teaches the data driver adjusts the ratio between the periods of the high voltage level and the low voltage level according to the brightness adjustment signal (pages 1,2, paragraph 12,13, pages 2,3, paragraph 32).

Further Regarding Claim 7,15 and 23 Sono teaches the data driver adjusts the ratio between the periods of the high voltage level and the low voltage level of the voltage controlling signal according to the voltage level of the second terminal (pages 1,2, paragraph12,13, pages 2,3, paragraph 32).

Allowable Subject Matter

7. Claims 4,5,12,13,20,21 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: Applicant's arguments filed on 03-29-2007 are convincing. As argued by applicant in remarks under claim rejection page 20, 2nd paragraph from the bottom, prior art of Kawabe et al. (US 2003/0169247 A1) in view of Sono (US 2003/0117361 A1) and cited prior art on 892's fails to recite or disclose the uniquely distinct features represented by underlined bold claim below;

The driving voltage generator comprises: a switch having a control gate for receiving the voltage controlling signal and turned on or off according to voltage level of the voltage controlling signal; an inductor coupled between the switch and a power source; a diode coupled between the switch and the inductor; and a capacitor coupled to the diode, wherein the connection point of the capacitor and the diode outputs the driving voltage and the level of the driving voltage is generated according to the ratio between the periods of the high voltage level and the low voltage level.

Response to Arguments

9. Applicant's arguments, see remark, filed 03-29-2007, with respect to the rejection(s) of claim(s) 1,3,4,7,9,17 and 24 under 35 U.S.C. 102(e) as being anticipated by Kawabe et al. (US 2003/0169247 A1) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in Kawabe et al. (US 2003/0169247 A1) in view of Yamada, Atsushi (US 2003/0169226).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Koga, Koichi et al. (US 2003/0222840 A1) Liquid crystal display device and driving method for liquid crystal display device.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prabodh M. Dharia whose telephone number is 571-272-7668. The examiner can normally be reached on M-F 8AM to 5PM.

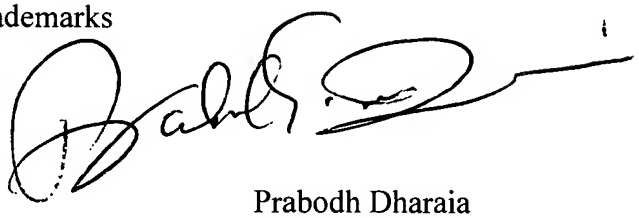
12. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231



Prabodh Dharaia

Partial Signatory Authority

AU 2629

April 19, 2007